ARCADIAN

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CES REPORT This page is going to the printer on June 9 after a hectic weekend in Chicago. I was hoping for a really definitive statement on the Add-Under, but Mr. Ray George only announced that "it will be shipped by the end of the year". We did receive what I understand to be the final specifications, showing 64K of RAM, for creating your own programs, 32K of ROM, which contains the Zgrass language and the math package (trig functions, square roots, with 13 digit accuracy, etc). It is also possible to add user-generated commands or functions (stored on a tape or disc) to supplement what is already there. Two RS-232 ports are included to support the disc system, printer, or any CP/M compatible equipment you want to add. Then there is the 4K of dynamic memory used to store the screen image. Total, 100K. The price level of 600. remains. I have a six-page list of specifications and comparison charts - if you are interested, send me a self-addressed stamped envelope (legal size). I will automatically send one to each of you that responded to my question of last month. The full-screen editing function is also capable of changing and moving text characters about, and with global search and change capability, plus disc storage, one has a word processor!

ATARI AND COMMODORE SUIT The biggest news from the Astrocade point of view was the announcement that they had filed suit against Atari and Commodore, in which they allege that these companies have used techniques that are covered by patents under control of Astrocade. Late last year, two patents were granted (4296930 and 4301503) which define the video display technique of bit mapping (in which the status of each pixel on the tv screen is stored in memory). Astrocade feels that since they received exclusive rights to the entire system, they can press this suit. Bally is an involuntary co-plaintiff. Atari response was 'frivolous', but you didn't expect them to say 'ooops'.

VIDEOCADE SCHEDULE Ten items were promised for delivery between now and the middle of October. First out will be The Incredible Wizard (2017) (2 players together). The next in line is Conan The Barbarian (5004), an adventure game with Conan battling over 100 monsters as he works his way thru the rooms of the maze, picking up treasures and avoiding pitfalls. (2 players) Short notes: Pirate's Chase, (2015, 2 players together); Solar Conqueror (2018, 2 players) is a souped-up asteroid-type game with gravity and terrific color graphics; Cosmic Raiders (2019, 2 players) is the defender-type game; Bowling (3006, 4 players); Soccer (3007, 4 players) has features of both soccer and foosball and is a new entry; Artillery Duel (5005, 2 players) is our old favorite, with lots more action; Music Maker (4003, 1 player) now uses two hand controllers and a keypad overlay to give you full control over all the sound generating capabilities of the Arcade in a real-time sense. Includes a cassette interface; and Creative Crayon (4005, 1 player -4005P with light pen) This is the old Coloring Book with much more added. There are now 23 menu commands which allow snap and show, loading to and from tape, overlaying of programs, box, line, and circle, plus adding your own custom work because in addition to the typical 8K ROM in the videocade, there will also be a 1K RAM. The light pen will have the usual photoelectric cell, but in this application, it will be located at the connector, and a fiber optic rod will be used to transmit the screen illumination to the cell. This will allow a very small bit of screen area to be picked up - to one pixel. I'm wondering when we'll get some program to allow Computer Aided Drafting after this is released.

TV ADVERTISING STEPPED UP 37 cities are now on the list to be receiving commercials. A new one started June 6. They will also produce another one for the Christmas sale period, emphasizing Wizard. They have also started a magazine campaign (Omni, etc). In another scheme, they will have the Wizard game played on the new 50 foot tv scoreboard screens now appearing at football stadiums.

PLAYING GAMES IS TIRING Yes, when you do it for hours at atime, standing up. There were about 12 of us there manning the 9 machines they had set up in towers, each with a different game. We were showing games to dealers and retailers as the various distributors made their sales pitches. The most enjoyable part of the activity was meeting a number of subscribers who have up to now been only names on a list or voices on the 'phone, plus the renewal of friendships made previously.

FORMAT CHANGES mentioned last month, will hopefully be completed by the October issue. We plan to add more material to the Arcadian - but will need contributions.

Printed for the mutual edification of the publisher and subscribers who are owners of the ARCADE unit, its programmable BASIC cartridges, and the ZGrass language. Printing is by a COMPRINT 912S (programs) and a NEC 8023 (text - driven by an Apple with Super-Text and Magic Window word processing systems.)

Since the Newsletter is 95 percent subscriber-generated, material is always in demand. Text material should be submitted as typewritten copy, preferably 47 characters per line and single spaced. Program material should be submitted both as a listing and on tape. Contributions are accepted without payment. However, programs entered in the Contest (accompanied by a signed statement indicating "this program is largely my own efforts and not a copy of an existing program") will be eligible for a prize. At least three programs are required for the Contest to operate. A panel of five judges will determine which of the submitted programs is "best." In addition, it is our policy to accumulate certain programs for subsequent sale on a tape, for which an author's royalty will be paid.

Due to technical difficulties, the computer printout of program listings cannot illustrate certain characters. Accordingly, the following lower case letters and characters, when found in a program listing, have these respective meanings: a = *right arrow* b = × *(multiply)* c = ÷ *(divide)* _ = *left arrow* ' = *down arrow.*

The Accountant will be very appreciative of a SASE when a response to a communication is required.

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RIGEL IS BALLY BASIC ONLY Yes, I totally missed that one.

TRAVEL SCHEDULES PRECLUDED A CONTEST THIS MONTH. I've had to close off the ARCADIAN somewhat early because of Company travel, plus my attendance at the Summer CES in Chicago.

ANOTHER CONTEST!! Yes, the VIPER people are sponsoring a programming contest to run over the Summer months. This is a preliminary announcement - more details next time - but you have another month's time to think about 'what to do'. The contest rules are pretty flexible. Write a good program, in any language (old Bally Basic, new Astro Basic, Extended Basic, Machine Code), and they will give away a substantial prize of VIPER equipment to the author of the program they like the best (therefore it can be of any type). All programs become the property of VIPER, with future utilization and exploitation of the programs to be discussed with the authors. Results will be announced in the October ARCADIAN. By the way, their new telephone number is 207-623-8506.

CARTRIDGE SWAPPING - 3: Final chapter in the ongoing saga as continued from page 59. This segment describes Dave Ibach's suggestions regarding storing a subroutine inside a program to automatically allow for conversion from new AstroBasic to the older BallyBasic. Dave suggests:

-have your program in place with the new basic in the cartridge slot.

-make the first statement of your basic program look something like this:

```
1 CY=40;PRINT °SWAP NOW°;CALL19900
```

This is so that after loading the program with the new basic, you can simply RUN and automatically be instructed to swap and automatically call the routine. The last thing the routine does is to put a period {.} at %{-24574} so that this statement becomes a remark after the swap and you can RUN without executing it again.

-enter the routine like this: FOR N=19900 TO 19972 STEP 2;CY=40;INPUT %{N};NEXT N and respond to prompts with the numbers below {read down columns}. The routine is relocatable, so put it elsewhere if necessary.

-:PRINT to record the routine along with your program.

-execute as follows: load with new basic
RUN
swap to old basic
RUN

Dave Ibach
19553 Dartmouth Pl.
Northville, MI 48167

And here is the routine:

1779	-4618	9072	21485	24398	1870	8451
8464	8283	-388	20050	20130	1536	-24574
0	-20658	8272	255	10	32002	11838
-13533	3283	12793	31509	8221	1696	-29245
10364	8519	20430	22599	26207	20070	36
4347	20000					

```
  1 .BRICK 'N THE WALL
  2 .MIKE PEACE
  5 .b101135b10c1c10
 10 &(9)=-1;L=0;T=0;Z=0;FC=-32
 20 BC=FC+79;BOX 0,0,160,88,1;L=L+(L<4)
 30 NT=7;S=0;FC=FC+40;FOR A=-24539TO A+15;MU=%(A);NEXT A;BOX 0,-5,110,72,2
 40 FOR B=0TO 27STEP 9;BOX 0,B,120,5,(B#18);NEXT B
 50 GOSUB 190;FOR A=0TO 200;NEXT A;IF Z>4GOTO 170
 60 A=90;X=0;Y=0;B=RND (5)-3;C=-3;GOSUB 210
 70 FOR G=1TO 2;BOX A,-35,16-(Lb2),3,3;A=KN(1)c3+KN(1)c(18-L);BOX A,-35,16-(Lb2
),3,3
 80 BOX X,Y,2,2,3;X=X+B;Y=Y+C;BOX X,Y,2,2,3
 90 IF B=0B=RND (3)-2
100 IF Y>27C=-C;MU=70;B=B+RND (3)-2
110 IF Y<-20IF PX(X,Y+C)B=(X-A)bL
120 IF PX(X,Y+C)BOX (X+85)c10b10-80,Y+C+Cc5b5,10,3,(Y>-15)b3;C=-C;MU=95;IF Y>-1
5GOSUB 180;IF S=33GOTO 30
130 IF PX(X+B,Y)B=-B;MU=58;IF ABS(X)>50IF ABS(B)=1B=Bb2
150 IF Y<-37FOR H=90TO 70STEP -1;MU=H;NEXT H;Z=Z+1;GOSUB 210;GOTO 50
160 G=1;NEXT G
170 CY=-10;CX=-15;PRINT " GAME";CX=-15;PRINT " 0VER";FOR A=0TO 1;A=TR(1);NEXT A
;RUN
180 S=S+1;T=T+(Y+8)c5b2
190 CY=39;CX=-60
200 NT=0;PRINT " <SC0RE> ",#0,T," <BALLS> ",5-Z;NT=2;RETURN
210 BOX X,Y,2,2,3;BOX A,-35,16-(Lb2),3,3;RETURN
```

Either AB or BB

OLD GLORY
1982

by

E. D. Groebe

Either AB or BB

THIS PROGRAM USES ONE OF THE MANY BALLY ROM SUBROUTINES TO DRAW A COLOR PICTURE OF THE AMERICAN FLAG.

```
10 NT=8;&(10)=0;&(9)=50;BC=122;GOSUB 170
20 NT=0;CLEAR ;&(0)=7;&(1)=7;&(2)=122;&
   (3)=240;&(9)=0;&(10)=180;K=0
30 A=20200;W=7723;X=-22013
35 Y=17988
40 FOR G=0TO 1440STEP 240;GOSUB 200
50 NEXT G
60 W=3115;X=-235;G=0
70 GOSUB 200
80 W=299;X=-4095;Y=Y+80
90 FOR G=0TO 640STEP 160
95 FOR K=0TO 5;GOSUB 200
96 NEXT K
100 K=0;NEXT G
110 Y=Y+81
120 FOR G=0TO 480STEP 160
125 FOR K=0TO 4;GOSUB 200
126 NEXT K
130 K=0;NEXT G
140 CY=40;PRINT "■■■■■■■■OLD■■GLORY■■■■■■■
    ■■■■■■■■■■■■1981
160 FOR Z=0TO 5000;NEXT Z;RUN
170 PRINT "500050433 0+23300000+2330+235035
    400020022 0+1220+124000003235006000 2000
180 BC=7;PRINT "00x50x50x4x3x30+x2x3x30000
    0+x2x3x30+x2x3x4x3x27x2000
190 BC=240;PRINT "x10x10x107x1-x30x2x1x800
    00x1x2x3x5x1x2x3x556x3x2000x1
195 BC=7;RETURN
200 %(A)=-43
210 %(A+2)=W
220 %(A+4)=X
230 %(A+6)=Y+G+2xK
240 %(A+8)=-13871
250 CALL A;RETURN
```

For free tutorial on using the on-board color subroutine

send $1.00 to cover printing and postage to EDGE Software:

EDGE SOFTWARE

12046 FLAMBEAU DR.
PALOS HTS., IL. 60463

MACHINE CODE PROGRAMMING on the Arcade is an area that promises to hold great development. We have had a number of examples over the last two years of programs that included some machine code programming, all writtem using the old Bally Basic cartridge. It may take a little while for the experimenters to become familiar enough with the new cartridge and its capabilities to write programs with it, ... but I may be surprised. Anyway, the effects are primarily those of increased program speed, better color control, foreground/background independence, and smooth movement of characters. In order to learn this technique, a new language must be learned, new rules for manipulation , and close attention to detail must be maintained. Some excellent tutorial material has been published - in Microcomputing (portions of the Kilobaud Klassroom, starting with Nov 80) by Peter Stark - in Softalk (in the Assembly Lines articles-now published as a book). The above articles describe the 6500 and 6800 families of microprocessors, but the general techniques work as well with our Z-80, just some command words are changed. The book "Programming the Z-80" by Rodnay Zaks contains more than you want to know (in over 600 pages), but it has a lot of explanatory detail on every command.

We can 'talk' to the Z-80 in two ways, one is through the Basic cartridge, while the other is more direct using the Bit Fiddler cartridge. The experienced programmer, who is comfortable in writing hex code, will find the Bit Fiddler unit very valuable - see the reviews in recent issues. For the person who understands Basic fairly well and wishes to try something more advanced, the Z-80 MINI COURSE is recommended.
A review of this document by Al Rathmell follows: (see ad, p.69)

"The MINICOURSE on machine programming is in general very good. The course begins with an introduction to machine language programming principals. Part of this section was apparently extracted from the Zilog Z80 users manual. I would recommend that anyone seriously contemplating machine language programming purchase the Z80 users manual. This manual gives the detail necessary to understand the Z80 instructions.

"The section on Bally system operation gives a good description of the three custom chips which are responsible for much of the Bally's powerful graphics capability. All the input/output ports are well defined. Since the custom chips and their associated I/O ports are unique to the Bally/Astrovision system, this section is particularly valuable.

"The section on Bally Basic memory usage gives a good description of how Basic mixes graphics and program text.

"There is a good discussion on the reason hexadecimal (Base 16) numbering is used to represent binary numbers. The definition of two's complement numbers is not entirely correct. The two's complement of a number is defined as the one's complement (i.e. bit reversal) plus one. In two's complement plus and minus numbers do not complement each other but excluding a carry do sum to zero.

"The rest of the course deals with converting numbers as well as developing and loading machine language code. The use of the stack is described. The starting location of the stack is at the top rather than at the bottom as stated in the text. The alternate register set, and some of its uses is defined. There is a good description of interrupt processing - a most important aspect of machine language programming.

"The mechanics of producing machine code following this course are to convert Z80 opcodes and data into decimal numbers and poke these numbers into memory. I prefer poking the opcode and data in hexadecimal (see the program "Hex Poker" in Vol 3) since that is the standard for representing machine opcodes. In any case either method is tedious and time-consuming. An assembler is what we really need!"

```
  1 .
  5 CLEAR ;NT=0;BC=0;FC=127
 10 PRINT "$$$$$$$$$$$$$$$";PRINT " SLOT MACHINE";PRINT "$$$$$$$$$$$$$$$
 20 E=RND (10)b5
100 &(9)=22;&(0)=0;&(1)=0;&(2)=5;&(3)=5
110 BOX 35,0,40,60,1;BOX 35,30,30,10,1;BOX 35,-33,54,5,1
120 BOX 57,5,4,9,1;BOX 60,5,3,3,1;BOX 63,16,2,25,1;BOX 64,28,5,4,1
130 GOSUB 1090
140 BOX 35,-17,32,26,2;BOX 35,-17,30,24,1;BOX 35,-20,28,14,2
150 CY=12;CX=-59;PRINT "YOU HAVE";PRINT "      $",#0,E
155 IF E=0BOX -38,-10,83,60,2;CY=0;PRINT "YOU'RE BUSTED";STOP
160 PRINT ;PRINT "INSERT COIN/S
170 B=KN(1)c50;B=B+3;CY=-20;PRINT #7,B;IF TR(1)=0GOTO 170
180 E=E-B;CY=4;PRINT "      $",#0,E
190 GOSUB 1080                                          Either AB or BB
200 IF E<0E=E+B;GOTO 150
290 CX=-77;CY=-16;PRINT " PULL HANDLE";IF JY(1)=0GOTO 290
295 CY=-20;CX=28;PRINT "    "
296 GOSUB 1090;GOSUB 1080
300 FOR A=28TO 7STEP -1
310 BOX 64,A,5,4,1
320 BOX 64,A+4,5,4,2                                    Al Roginsky
330 NEXT A                                              4327 Thorndale Rd
400 FOR A=6TO 28                                        Las Vegas, NV
410 BOX 64,A,5,4,1                                      89103
420 BOX 66,A-4,5,4,2
440 NEXT A
1000 Z=1500;CY=18;S=27;FOR A=1TO 3;GOSUB 1100;NEXT A
1010 S=36;FOR A=1TO 2;GOSUB 1200;NEXT A;S=45;FOR A=1TO 2;GOSUB 1300;NEXT A
1020 GOTO 2000
1080 BOX -42,-18,77,37,2;RETURN
1090 BOX 35,18,30,10,2;RETURN
1100 CX=S;GOSUB Z;J=I;CX=S+9;GOSUB Z;CX=S+18;GOSUB Z;RETURN
1200 CX=S;GOSUB Z;K=I;CX=S+9;GOSUB Z;RETURN
1300 CX=S;GOSUB Z;L=I;RETURN
1500 R=RND (100)
1510 IF R>80TV=47;BOX CX-8,CY-2,2,2,1;BOX CX-5,CY-1,2,2,1;I=1
1520 IF R>62IF R<81TV=98;BOX CX-7,CY,5,5,3;I=2
1530 IF R>47IF R<63TV=48;BOX CX-7,CY,3,5,1;I=3
1540 IF R>36IF R<48TV=96;BOX CX-7,CY,3,5,3;I=4
1550 IF R>21IF R<37TV=43;BOX CX-7,CY,3,3,1;I=5
1560 IF R>10IF R<22BOX CX,CY,7,9,2;BOX CX,CY,6,3,1;I=6
1570 IF R>5IF R<11TV=61;BOX CX-7,CY,1,5,1;BOX CX-7,CY,3,1,1;I=7
1580 IF R<6TV=98;BOX CX-7,CY,5,5,3;BOX CX-7,CY,1,7,3;I=0
1600 RETURN
2000 IF J=1M=2;IF K=1M=5;IF L=1M=10
2010 IF J=2IF K=2IF (L=2)+(L=6)M=10
2020 IF J=3IF K=3IF (L=3)+(L=6)M=15
2030 IF J=4IF K=4IF (L=4)+(L=6)M=20
2040 IF J=5IF K=5IF (L=5)+(L=6)M=15
2050 IF J=6IF K=6IF L=6M=25
2060 IF J=7IF K=7IF L=6M=50
2070 IF J=7IF K=7IF L=7M=100
2080 IF M CY=-20;CX=28;PRINT #0,MbB
2090 M=MbB;E=E+M
2100 M=0;GOTO 150
```

SCREEN PRINTER While Rich Tietjens has been working on an interface with the TRS-80 for quite some time now, the solution has eluded him so far. He does have an interesting tidbit here with the capability to print the Arcade's picture off the tv screen, onto a TRS printer, their new Line Printer VII.

The included illustrations of Jekyl and Hyde and the art work were done this way. I'm going to put in a disclaimer right now - I have not personally checked this material as I do not have the equipment. Those with access to the TRS are urged to experiment and report back. (300 baud only)

SCREEN DUMP FOR TRS-80 LINE PRINTER VII & SERIAL PORT

```
29500 A=0;FOR P=-80TO -72;FOR Z=35TO 43;BOX P,Z,1,1,2-@(A);A=A+1;NEXT Z;NEXT P;R
ETURN
29510 %(C)=27;%(C+1)=16;%(C+2)=0;%(C+3)=160;C=C+4;RETURN
30500 FOR Z=20180TO C-1;CY=40;CX=-78;TV=%(Z);NEXT Z;C=20180;RETURN
31000 :PRINT ;C=20180;%(C)=18;C=C+1;A=0;FOR X=-80TO -72;FOR Y=35TO 43;@(A)=PX(X,
Y)
31001 A=A+1;NEXT Y;NEXT X;GOSUB 30500
32000 FOR Y=43TO -44STEP -7;IF Y>34GOSUB 29500
32005 GOSUB 29510;FOR X=-80TO 79
32010 M=1;V=0
32020 FOR L=YTO Y-6STEP -1
32025 IF L<-44M=0
32030 V=V+PX(X,L)bM;M=Mb2
32040 NEXT L;%(C)=128+V;C=C+1;IF C=20270GOSUB 30500
32050 NEXT X;GOSUB 30500;CY=40;CX=-78;PRINT ;NEXT Y
32060 TV=30;PRINT ;:RETURN ;RETURN
```

Rich Tietjens
PSC Box 542
APO Miami
34004

PARALLEL PORT VERSION:

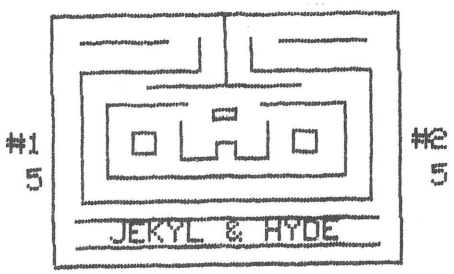
```
30000 &(P)=27;&(P)=16;&(P)=0;&(P)=160;RETURN
31000 P=255;&(P)=18;FOR Y=43TO -43STEP -7;GOSUB 30000
32000 FOR X=-80TO 79
32010 M=1;V=0
32020 FOR L=YTO Y-6STEP -1
32025 IF L<-44M=0
32030 V=V+PX(X,L)bM;M=Mb2
32040 NEXT L;&(P)=V+128
32050 NEXT X;&(P)=13;NEXT Y
32060 &(P)=30;&(P)=13;RETURN
```

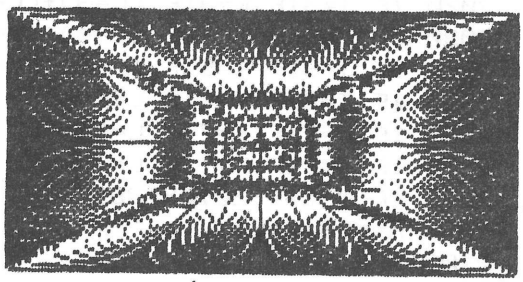
Bally Basic only

BOTH VERSIONS ARE CALLED BY A "GOSUB 31000"

DRIVER FOR TRS-80 LINE PRINTER VII

```
25000 CLEAR ;U=1;Z=%(20050)-8;INPUT "1ST LINE "F,"LAST LINE "E
25002 CLEAR ;FOR S=-24578TO Z;IF %(S+2)#FNEXT S
25005 NT=1;:PRINT ;TV=U+29;#PRINT
25010 A=S;GOSUB 26000;FOR A=ATO Z;L=L+1;B=%(A)c256;IF (B=13)+(B=-243)GOSUB 26000
25020 IF C#ENEXT A
25030 :RETURN ;STOP
26000 A=A+2;C=%(A);LIST C,1;FOR L=LTO 0STEP -1;GOSUB 26010;NEXT L
26010 MU=32;RETURN
```





```
 1 .
 2 .
 3 .LASER EVADER
 4 .BY DAVE MARTIN
 5 S=0;Y=-35;N=-40;&(21)=3;&(19)=0
10 CLEAR ;NT=0;BC=0;FC=117
20 &(20)=10
30 FOR A=30TO -30STEP -15
40 FOR B=-30TO 30STEP 60
50 FOR C=11TO 7STEP -2
60 BOX B,A,C,C-3,3
70 NEXT C;NEXT B;NEXT A
80 FOR A=-30TO 30STEP 15
90 BOX 0,A,53,2,3;BOX 0,A,45,2,2
95 NEXT A
100 FOR A=-70TO -50STEP 10
110 BOX A,25,3,5,1
120 NEXT A
130 GOTO 350
140 NT=15;MU=72;NT=0
150 F=RND (5)b15-45
160 BOX 0,F,45,2,3
170 RETURN
300 Y=-35;T=0;BOX 0,Y,3,5,1
310 T=T+1;&(19)=70-Y;Z=(JY(1)=1)b4;Y=Y-2;IF Y+Z<-36Y=-35
315 Y=Y+Z;IF Y#-35BOX 0,Y+2-Z,3,5,2;BOX 0,Y,3,5,1
320 P=(RND (3)=1)
330 IF PGOSUB 140;IF F<Y+4IF F>Y-3GOTO 500
335 IF PGOSUB 160
338 IF Y<35GOTO 310
340 S=S+135-T;&(19)=0
350 CY=40;PRINT "SC0RE:",#1,S
360 &(20)=0
370 NT=8;FOR Z=1TO 3
380 FOR Q=49TO 53STEP 2
390 MU=Q;NEXT Q
400 NEXT Z;MU=56;MU=48
410 FOR Z=0TO 100;NEXT Z
420 NT=0;&(20)=10;&(21)=3
430 BOX 0,Y,3,5,2
440 BOX 0,F,45,3,2
450 GOTO 300
500 FOR A=1TO 15
510 FOR B=17TO 23
520 &(B)=RND (255)
530 NEXT B
540 NEXT A
550 FOR A=17TO 23;&(A)=0;NEXT A
560 N=N-10;FOR B=1TO 5
570 FOR A=1TO 5STEP 2
580 BOX N,25,A,A+2,3
590 NEXT A;NEXT B
600 BOX N,25,9,9,2;IF N>-65GOTO 350
610 CY=0;PRINT "          GAME 0VER    "
620 IF TR(1)RUN
630 GOTO 620
```

LASER EVADER is a cute little game of chance. The object is to move thru a field of lasers without being hit. The five laser units fire at random, making it difficult to predict when to pass one. If you make it safely to the top, up to 100 points are added to your score, depending upon how quickly you made the trip. You continue travelling thru the laser field, accumulating points until you are 'zapped' three times, and the game is over. Use joystick to move, TRigger to restart at end of game. Remember that gravity will tend to pull you back.

Dave Martin
3408 Braddock St.
Kettering, OH 45420

Either AB or BB

```
  5 CLEAR
  6 .PROG.L-I REVERSE BOX SET
  7 . S.KENDALL 1/25/82
570 &(9)=84
574 S=RND (30)b8
576 T=S+4
580 &(0)=S;&(1)=S
582 &(2)=T;&(3)=T
584 BC=RND (30)b8
586 FC=BC+4
590 PRINT "INPUT RND BOX SIZE
592 INPUT "  4a32"C
593 CLEAR ;IF C<4 C=4;IF C>32 C=32
594 B=RND (C)
600 FOR A=2TO 72STEP 2
620 BOX -42-B,0-B,A,A,3
622 BOX -42-B,0+B,A,A,3
624 BOX -42+B,0+B,A,A,3
626 BOX -42+B,0-B,A,A,3
630 NEXT A
650 FOR D=72TO 2STEP -2
670 BOX 42-B,0-B,D,D,3
672 BOX 42+B,0+B,D,D,3
674 BOX 42+B,0-B,D,D,3
676 BOX 42-B,0+B,D,D,3
680 NEXT D
690 FOR F=1TO 300;NEXT F
700 FOR G=-80TO 80STEP 2
710 BOX G,0,1,80,3
720 NEXT G
728 IF &(22)=16GOTO 5
730 GOTO 594
```

```
  2 .COMPUTER CROCHET
  3 . BY TOM  McCONNELL
 10 CLEAR
 20 K=RND (4)b2
 22 FC=RND (255);BC=RND (32)b8+4+FC
 30 C=3
 40 Q=RND (7);IF Q<3C=Q
 50 S=RND (6)b2+2
 55 IF (K=S)+(K>S)IF C<3 GOTO 50
 60 FOR R=0TO RND (15)b2+10STEP S
 65 FOR Z=-RTO RSTEP S
 70 BOX Z,R,K,K,C
 80 BOX R,Z,K,K,C
 90 BOX -R,Z,K,K,C
100 BOX -Z,-R,K,K,C
110 NEXT Z
120 NEXT R
125 FOR T=1TO 999;NEXT T
130 GOTO 20
```

Either AB or BB

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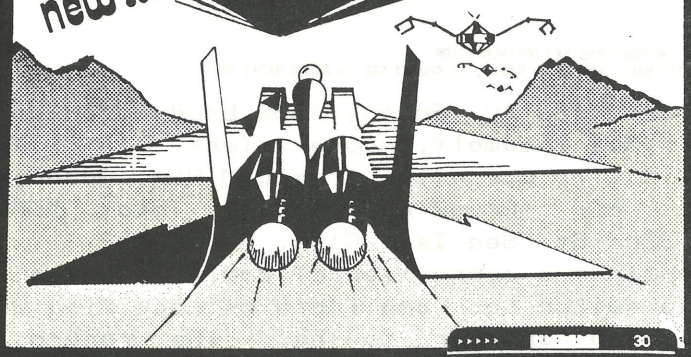

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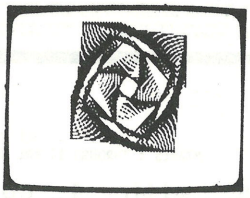

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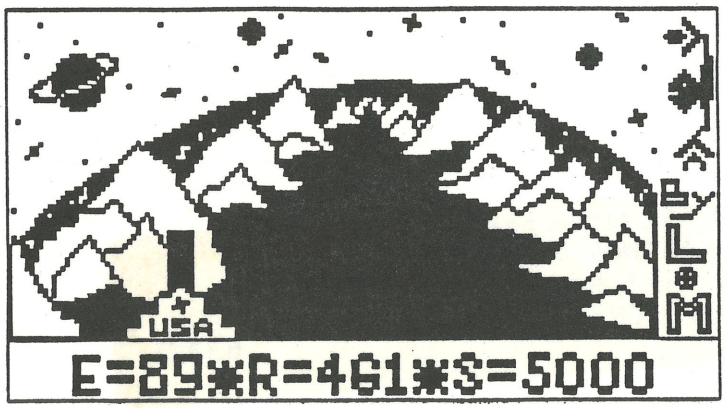

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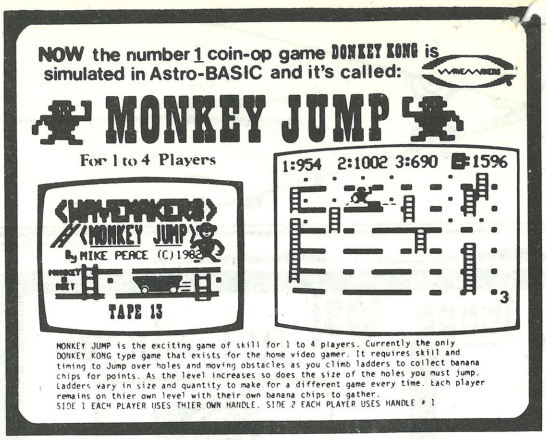

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